

1 positioned within high tension spring 1016. This configuration enables anvil pull 1230 and
2 cutter 1400 to both be spring biased.

3 The present invention may be embodied in other specific forms without departing
4 from its spirit or essential characteristics. The described embodiments are to be considered
5 in all respects only as illustrative and not restrictive. The scope of the invention is, therefore,
6 indicated by the appended claims rather than by the foregoing description. All changes
7 which come within the meaning and range of equivalency of the claims are to be embraced
8 within their scope.

9 What is claimed and desired to be secured by United States Letters Patent is:

1 1. A compression plate anastomosis apparatus for anastomosing a first vessel
2 to a second vessel, comprising:

3 a first compression plate having a first compression plate opening;

4 wherein the first compression plate opening is defined by first holding means
5 for holding a portion of a first vessel that defines a first vessel opening in a manner
6 such that the portion defining the first vessel opening is at least partially everted and
7 is not penetrated; and

8 a second compression plate having a second compression plate opening;

9 wherein the second compression plate opening is defined by second holding
10 means for holding a portion of a second vessel that defines a second vessel opening,

11 wherein the first compression plate and the second compression plate have
12 means for locking the compression plates together such that the portion defining the
13 first vessel opening and the portion defining the second vessel opening are joined
14 without being penetrated such that the first vessel and the second vessel are
15 anastomosed together.

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17 2. A compression plate anastomosis apparatus as recited in claim 1, wherein the
18 first and second compression plates are snap-fit compression plates that are configured such
19 that the locking means snap into place when the compression plates are brought together.

20
21 3. A compression plate anastomosis apparatus as recited in claim 1, wherein the
22 locking means comprises a plurality of locking arms extending from an outer periphery of
23 a ring of the first compression plate and a locking extension of the second compression plate.

1 4. A compression plate anastomosis apparatus as recited in claim 3, wherein the
2 locking arms of the first compression plate have a length that enables the arms to lock around
3 the locking extension in a manner such that the portion defining the first vessel opening and
4 the portion defining the second vessel opening are held together without being damaged in
5 a manner that causes the anastomosis to fail.

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7 5. A compression plate anastomosis apparatus as recited in claim 1, wherein the
8 first holding means comprises a plurality of holding tabs extending from an inner periphery
9 of a ring of the first compression plate.

10
11 6. A compression plate anastomosis apparatus as recited in claim 1, wherein the
12 second holding means is a holding surface located around the second compression plate
13 opening with a configuration such that the portion of the second vessel defining the second
14 vessel opening may be everted onto the holding surface.

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16 7. A compression plate anastomosis apparatus as recited in claim 6, wherein the
17 holding surface extends radially downward at an angle from the second compression plate
18 opening.

1 8. A compression plate anastomosis apparatus as recited in claim 1, wherein the
2 locking means comprises means for guiding the movement of one compression plate relative
3 to the other, wherein the guiding means extend from one of the compression plates to enable
4 one compression plate to be moved in a fixed parallel orientation relative to the other
5 compression plate, wherein the guiding means have a length and configuration that permits
6 the first vessel opening and the second vessel opening to be initially spaced apart and
7 opposite from each other and then to be advanced toward each other as one compression
8 plate is moved toward the other while each holding means holds the respective vessels until
9 the compression plates bring the second vessel portion that defines the second vessel opening
10 into contact with the first vessel portion that defines the first vessel opening such that the first
11 vessel and the second vessel are anastomosed together.

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13 9. A compression plate anastomosis apparatus as recited in claim 8, wherein the
14 compression plate opposite from the compression plate from which the guiding means
15 extends has plurality of holes through which the the guiding means are inserted such that the
16 compression plate is a gliably mounted on the guiding means, and wherein the holes are sized
17 to provide frictional resitance to movement of the glidably mounted compression plate on
18 the guiding means.

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20 10. A compression plate anastomosis apparatus as recited in claim 1, wherein the
21 first holding means comprises a first plurality of holding tabs and wherein the second holding
22 means comprises a second plurality of holding tabs.
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1 11. A compression plate anastomosis apparatus as recited in claim 1, wherein said
2 first and second compression plates each have an inner periphery at their respective opening,
3 wherein said first and second holding means are located on the inner peripheries of the
4 respective first and second compression plates.

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6 12. A compression plate anastomosis apparatus as recited in claim 1, wherein said
7 first holding means are in mating configuration with respect to said second holding means
8 once the second vessel is brought into contact with the first vessel for anastomosis.

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10 13. A compression plate anastomosis apparatus as recited in claim 1, wherein said
11 second holding means is adapted to hold the portion of the second vessel that defines the
12 second vessel opening in a manner such that the portion defining the second vessel opening
13 is at least partially everted.

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15 14. A compression plate anastomosis apparatus as recited in claim 1, wherein said
16 guiding means extend from the first compression plate with a perpendicular orientation.

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18 15. A compression plate anastomosis apparatus as recited in claim 1, wherein the
19 locking means comprises at least one locking arm extending from an outer periphery of a ring
20 of one of the compression plates and a locking extension on the other compression plate.

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22 16. A compression plate anastomosis apparatus as recited in claim 1, wherein the
23 first compression plate and the second compression plate are adapted for use with vessel
24 openings that are generally circular.

1 17. A compression plate anastomosis apparatus as recited in claim 15, wherein
2 the first compression plate and the second compression plate are adapted for use with the
3 vessel openings that are noncircular.
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1 18. A compression plate anastomosis apparatus for anastomosing vessels,
2 comprising:

3 a first compression plate a first compression plate opening;

4 wherein the first compression plate opening is defined by a plurality of
5 holding tabs extending from from a ring of said first compression plate to hold a
6 portion of a first vessel that defines a first vessel opening in a manner such that the
7 portion defining the first vessel opening is at least partially everted and is not
8 penetrated; and

9 a second compression plate having a second compression plate opening;

10 wherein the second compression plate opening is defined by a holding surface
11 located around the second compression plate opening with a configuration such that
12 the portion of the second vessel defining the second vessel opening may be everted
13 onto the holding surface;

14 wherein the first compression plate and the second compression plate have
15 mated locking components to lock the compression plates together such that the
16 portion defining the first vessel opening and the portion defining the second vessel
17 opening are joined without being penetrated such that the first vessel and the second
18 vessel are anastomosed together.

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20 19. A compression plate anastomosis apparatus as recited in claim 18, wherein
21 the first and second compression plates are snap-fit compression plates that are configured
22 such that the locking components snap into place when the compression plates are brought
23 together.
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1 20. A compression plate anastomosis apparatus as recited in claim 18, wherein
2 one of the the mated locking components comprises a plurality of locking arms extending
3 from an outer periphery of the ring of the first compression plates and the other mated
4 locking component is a locking extension extending from the second compression plate.
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6 21. A compression plate anastomosis apparatus as recited in claim 20, wherein
7 the locking arms have a length that enables the arms to lock around the locking extension in
8 a manner such that the portion defining the first vessel opening and the portion defining the
9 second vessel opening are held together without being damaged in a manner that causes the
10 anastomosis to fail.
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12 22. A compression plate anastomosis apparatus as recited in claim 18, wherein
13 the plurality of holding tabs extending from an inner periphery of the ring of the first
14 compression plate.
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16 23. A compression plate anastomosis apparatus as recited in claim 18, wherein
17 said plurality of holding tabs extend from the ring of the first compression plate toward an
18 anastomosis side of the first compression plate.
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20 24. A compression plate anastomosis apparatus as recited in claim 18, wherein
21 said plurality of holding tabs extend perpendicularly from the ring of the first compression
22 plate.
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25. A compression plate anastomosis apparatus as recited in claim 18, wherein said plurality of holding tabs curve inward from an exterior side of the ring of the first compression plate such that distal ends of the holding tabs are perpendicularly oriented relative to the exterior side of the ring of the first compression plate.

26. A compression plate anastomosis apparatus as recited in claim 18, wherein the holding surface extends radially downward at an angle from the second compression plate opening.

27. A compression plate anastomosis apparatus as recited in claim 18 wherein the first compression plate and the second compression plate are adapted for use with vessel openings that are generally circular.

28. A compression plate anastomosis apparatus as recited in claim 18, wherein the first compression plate and the second compression plate are adapted for use with the vessel openings that are noncircular.

29. A snap-fit compression plate anastomosis apparatus for anastomosing vessels,
comprising:

a first compression plate having a first compression plate opening;

wherein the first compression plate opening is defined by a plurality of
holding tabs extending from a ring of said first compression plate to hold a portion
of a first vessel that defines a first vessel opening in a manner such that the portion
defining the first vessel opening is at least partially everted and is not penetrated;
and

a second compression plate having a second compression plate opening;

wherein the second compression plate opening is defined by a holding surface
located around the second compression plate opening with a configuration such that
the portion of the second vessel defining the second vessel opening may be everted
onto the holding surface;

wherein the first compression plate has an outer periphery from which a
plurality of locking arms extend, wherein the locking arms are adapted to lock with
a locking extension projecting from the second compression plat that enables the
compression plates to lock together such that the portion defining the first vessel
opening and the portion defining the second vessel opening are joined without being
penetrated such that the first vessel and the second vessel are anastomosed together.

30. A compression plate anastomosis apparatus as recited in claim 29, wherein
the locking arms have a length that enables the arms to lock around the locking extension in
a manner such that the portion defining the first vessel opening and the portion defining the
second vessel opening are held together without being damaged in a manner that causes the
anastomosis to fail.

1 31. A compression plate anastomosis apparatus as recited in claim 29, wherein
2 the plurality of holding tabs extending from an inner periphery of the ring of the first
3 compression plate.

4
5 32. A compression plate anastomosis apparatus as recited in claim 29, wherein
6 said plurality of holding tabs extend from the ring of the first compression plate toward an
7 anastomosis side of the first compression plate.

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9 33. A compression plate anastomosis apparatus as recited in claim 29, wherein
10 said plurality of holding tabs extend perpendicularly from the ring of the first compression
11 plate.

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13 34. A compression plate anastomosis apparatus as recited in claim 29, wherein
14 said plurality of holding tabs curve inward from an exterior side of the ring of the first
15 compression plate such that distal ends of the holding tabs are perpendicularly oriented
16 relative to the exterior side of the ring of the first compression plate.

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18 35. A compression plate anastomosis apparatus as recited in claim 29, wherein
19 the holding surface extends radially downward at an angle from the second compression
20 plate opening.

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22 36. A compression plate anastomosis apparatus as recited in claim 29, wherein
23 the first compression plate and the second compression plate are adapted for use with vessel
24 openings that are generally circular.

37. A compression plate anastomosis apparatus as recited in claim 29, wherein the first compression plate and the second compression plate are adapted for use with the vessel openings that are noncircular.